SOME RESULTS OF THE "BELGICA" EXPEDITION.[1]

THE voyage of the *Belgica* is an important landmark in Antarctic exploration, for, in addition to its adventurous journey and its valuable geographical discoveries, it was the first expedition to make deep-sea collections within the Antarctic circle. The scientific results of the expedition are in process of publication in a fine series of volumes which will long be an indispensable work of reference on Antarctic geography and biology. The three memoirs the titles of which are given below contain further instalments of the geographical, botanical, and zoological contributions.

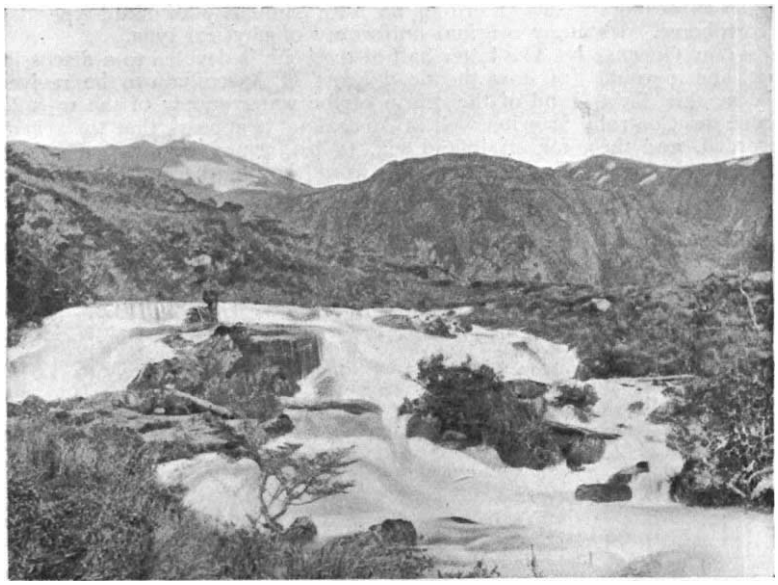

FIG. 1.—The stream falling into Torrent Bay, Beagle Channel.—Magellan Strait.

The second part of the first volume of the "Rapports scientifiques" of the expedition gives the technical geographical observations, and some account of the methods. Every effort has been made to remove uncertainty as to the geographical positions attained, as the calculations for some of them are repeated at length. The text is mainly devoted to detailed descriptions of the harbours and coasts visited in the Magellan Archipelago, and in the subsequent journey past Graham's Land and through Gerlache Strait, and there is a full account of the long drift of the *Belgica* in the ice, from February 19, 1898, to March 15, 1899. The volume is accompanied by an atlas of seven charts, of which those of Gerlache Strait and of the drift in the ice contain most new information. The text is illustrated by twenty-nine photographs and plates, many of which are of unusual merit. Most of the photographs were taken by Dr. Cook, others by M. Lecointe, and some by M. Arctowski.

M. É. de Wildeman's report on the phanerogams of the Magellan Archipelago is based upon the material collected by M. Racovitza, during a short stay there, before the departure of the expedition to the south. The report begins with a description of M. Racovitza's collection, and, as many of the species were imperfectly known, the author has taken this opportunity of giving a detailed account of them, illustrated by a series of fine plates. Then follows a systematic enumeration of the phanerogamic flora of the southern part of Patagonia and of the adjacent archipelago, and a detailed table of distribution. The author concludes that the new collections show that the flora of Tierra del Fuego is less primitive and distinct from that of the mainland of South America than had been thought. All the species are found on the American continent, and some of them have a wide distribution. Amongst other British species there are *Rumex maritimus*, on Tierra del Fuego, while *Urtica dioica* and *Veronica arvensis* occur on the mainland.

The memoir by M. Dollo on the fish collected by the *Belgica* discusses problems of more general interest than those of the two other reports. It includes a systematic description of the fish collected by the expedition, including three new genera—Cryodraco, Gerlachia, and Racovitzaia. The Cryodraco is of some historic interest, as a specimen no doubt belonging to this genus was caught frozen against the bow of the *Erebus* during Ross's expedition. The fish was sketched at the time by Robertson, but it was devoured by the ship's cat before it could

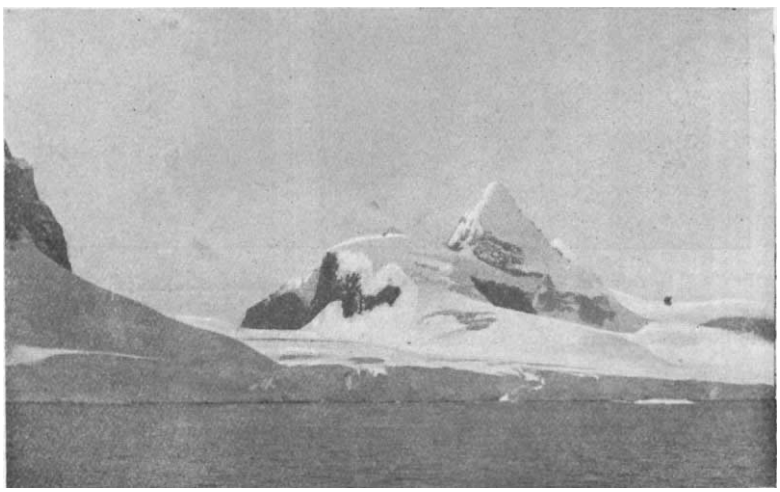

FIG. 2.—Sierra Du Fief (Wiencke Island).

[1] "Expédition Antarctique Belge. Résultats du Voyage du S.Y. *Belgica* en 1897-99 sous le Commandement de A. de Gerlache de Gomery" Rapports scientifiques. Travaux hydrographiques et Instructions nautiques. Vol. i., part i. By G. Lecointe. Pp. 110, xxix plates, with a portfolio of 7 charts. (Antwerp, 1905.)

"Botanique—Les Phanérogames des Terres Magellaniques." By É. de Wildeman. Pp. 222, xxiii plates. (Antwerp, 1905.)

"Zoologie—Poissons." By L. Dollo. Pp. 239, xii plates. (Antwerp, 1905.)

be preserved. The fishes collected by the *Belgica* in the Weddell Sea were all pelagic. One species, a Nematonurus, came from a depth of 2800 metres. In addition to the account of the first deep-sea fish collected within the Antarctic circle, there is an account of a larger collection made in the Magellan Archipelago, accompanied by a bibliography and full account of the fish fauna of that area. The fish are not only described and illustrated with M. Dollo's usual skill and care, but their significance is discussed in the very interesting chapters devoted to their zoo-

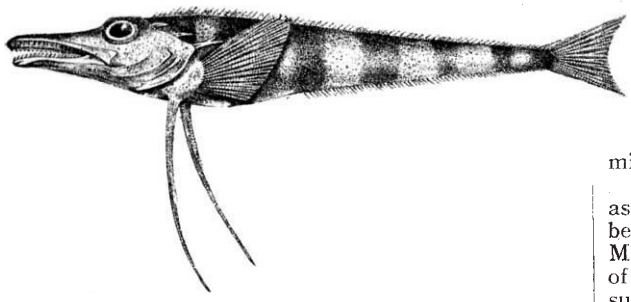

FIG. 3.—Cryodraco, according to Robertson's sketch made on the *Erebus*.

logical and geographical relations. M. Dollo maintains that the Antarctic fish are of modern development and highly specialised, and are not, as has been thought, a primitive fauna. He discusses the problem of bipolarity, which has commanded wide attention owing to its advocacy by Sir John Murray. M. Dollo maintains that the evidence of the fish gives no support to this theory. Thus he points out that in the Antarctic area the predominant family of fish is that of the Nototheniidæ, whereas in the Arctic Ocean the dominant group is the Cottidæ. In the wide distribution of the Nototheniidæ in the Southern Ocean and the South Pacific M. Dollo sees further support of the existence of the assumed Miocene Antarctic continent, connected with New Zealand, Australia,

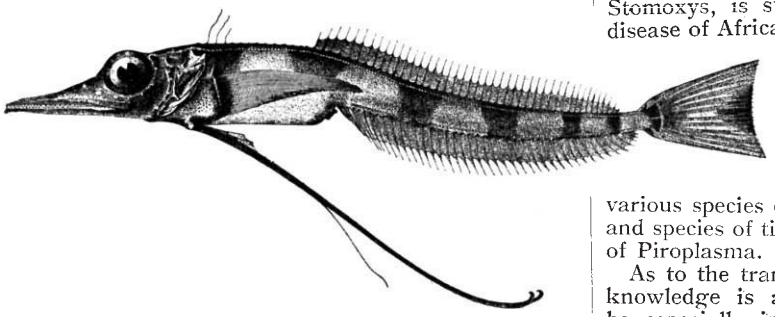

FIG. 4.—Cryodraco, according to Dollo.

and South America, but separated from South Africa; for eleven-twelfths of the Nototheniidæ are littoral species, and, according to Dollo, they can only have spread along the former shores of this sunken land.

J. W. G.

YELLOW JACK.[1]

THE main facts established regarding yellow fever and mosquitoes can be summed up in a few propositions.

(1) The cause of yellow fever is unknown.

(2) Yellow fever is transmitted by one particular mosquito, known to science as *Stegomyia fasciata*, and by no other mosquito or in any other way.

(3) In order to transmit the infection, the Stegomyia must have sucked the blood of a patient during the first three days of the fever, not earlier (during the incubation period), and not later.

(4) The infection is transmitted after an incubation period in the mosquito of not less than twelve days, and the mosquito may still be infectious fifty-seven days after its first infection.

It is a peculiar fact that although there are many species of Stegomyia, so far as is known it is only *S. fasciata* that is capable of transmitting the disease. If we may accept this as established, it points to a peculiar relationship between the mosquito and yellow fever which is not exactly paralleled by the case of any other disease-transmitting agent, be it mosquito, fly, or tick.

In the case of malaria, filariasis, and trypanosomiasis there is not this absolutely limited correlation between the disease and the agent that transmits. Malaria we know is transmitted only by mosquitoes of the subfamily Anophelina of the Culicidæ. This subfamily is divided into a number of genera, and not only do different species of the same genus, *e.g. Myzomyia culicifacies* and *Myzomyia funesta*, transmit malaria, but also species pertaining to different genera, *e.g. Pyretophorus costalis* and *Anopheles maculipennis*, or, if we do not accept these as different genera, and classify them all as belonging to a single genus, Anopheles, still we have the fact of transmission by different species. In filariasis the correlation between Filaria and the mosquito is still less definite; thus not only various species of Culex, but various species of Anopheles all permit of the development of the microfilariæ (filarial embryos) in their tissues. (It may be well to say in passing that the proof that mosquitoes actually do transmit Filaria is still wanting.)

Our knowledge of the correlation of trypanosomes and flies, especially species of Glossina, Tabanus, and Stomoxys, is still incomplete. Ngana, the tsetse-fly disease of Africa, is transmitted by species of Glossina, but not by Stomoxys or Tabanus. The trypanosome of sleeping sickness is transmitted by *Gl. palpalis* mainly, but also by other species; but it is not yet known which exactly these are.

Again, in the transmission of various species of Piroplasma by ticks, various genera and species of ticks suffice to transmit the same species of Piroplasma.

As to the transmission of Spirochætes by ticks, our knowledge is at present incomplete, and it would be especially interesting to discover if the relationship were as strict as it appears to be in yellow fever, for Spirochætes (invisible) have been suggested by Schaudinn as the possible cause of yellow fever.

The fact, then, that yellow fever appears to be transmitted by only one genus of mosquitoes, and only one species in that genus, points to some very peculiar relationship, and would suggest an organism as the cause, of a different kind from any of those we have mentioned, and, indeed, this is no doubt the case, as, if it had not been so, the cause would have been already discovered.

Yellow fever, then, is transmitted by a particular and practically world-wide mosquito, *Stegomyia fasciata*. The fact still requires emphasis that mosquitoes only *transmit* disease from the sick person to the healthy after certain changes have proceeded in the tissues of the mosquitoes, and that mosquitoes

[1] Report to the Government of British Honduras upon the Outbreak of Yellow Fever in that Colony in 1905, together with an Account of the Distribution of the *Stegomyia fas iata* in Belize, and the Measures necessary to stamp out or prevent the Recurrence of Yellow Fever. By Rubert Boyce, M.B., F.R.S. Pp. ix+104+13 Plates. (London: Waterlow and Sons Ltd., 1906.)